AM/FM STEREO RECEIVER

SX-450

OPERATING INSTRUCTIONS

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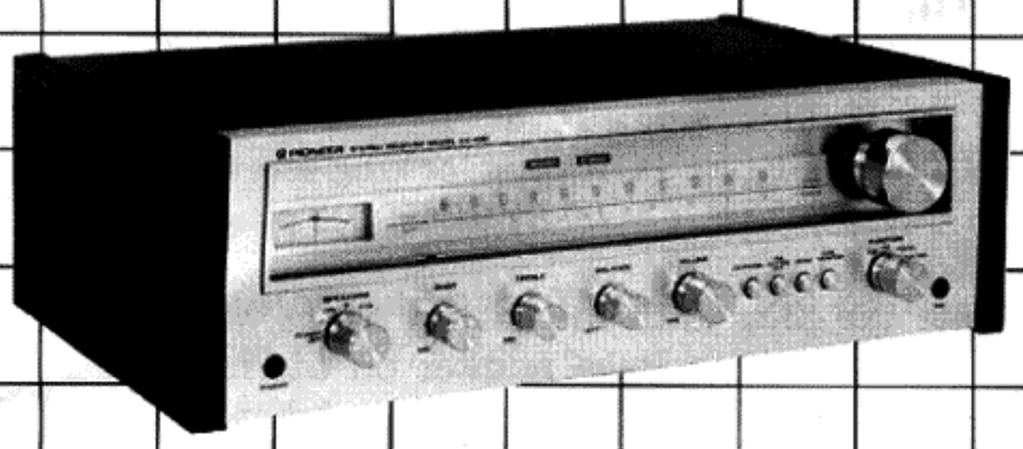

PIONEER®

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IMPORTANT-LINE VOLTAGE

The SX-450 is provided with a line voltage selector on the rear panel (Fig. A). This is normally pre-set to 220V, so before using for the first time, or if the unit is to be used in a different area, it is important to check the compatibility of the selector setting.

CHANGING THE LINE VOLTAGE SETTING

1. Disconnect the A.C. mains cord.
2. Use a Phillips screwdriver to take out the VOLTAGE SELECTOR plug locking screw.
3. Pull out the VOLTAGE SELECTOR plug from the socket.
4. Rotate the plug until the cutway aligns with the appropriate line voltage marker on the back of the unit, and then replace it in the socket.
5. Replace the locking screw.

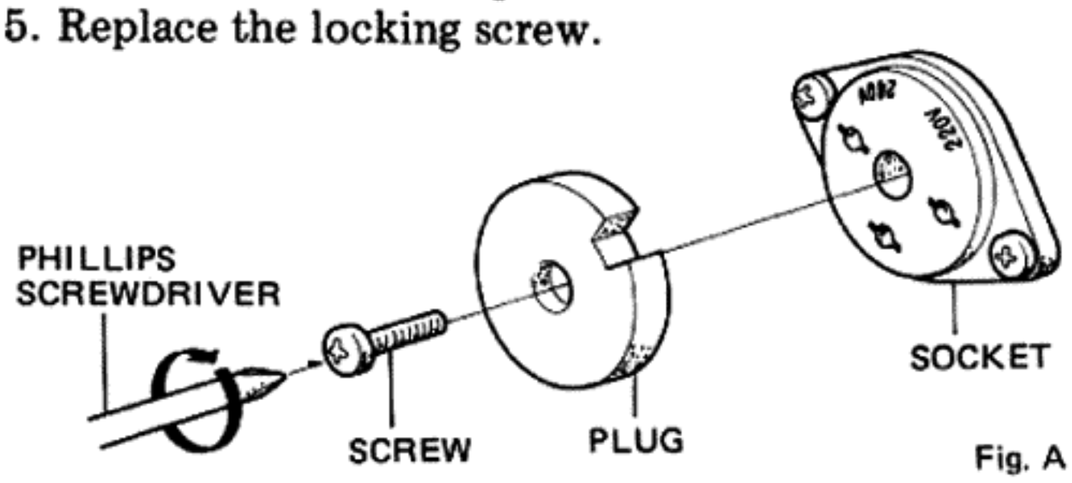


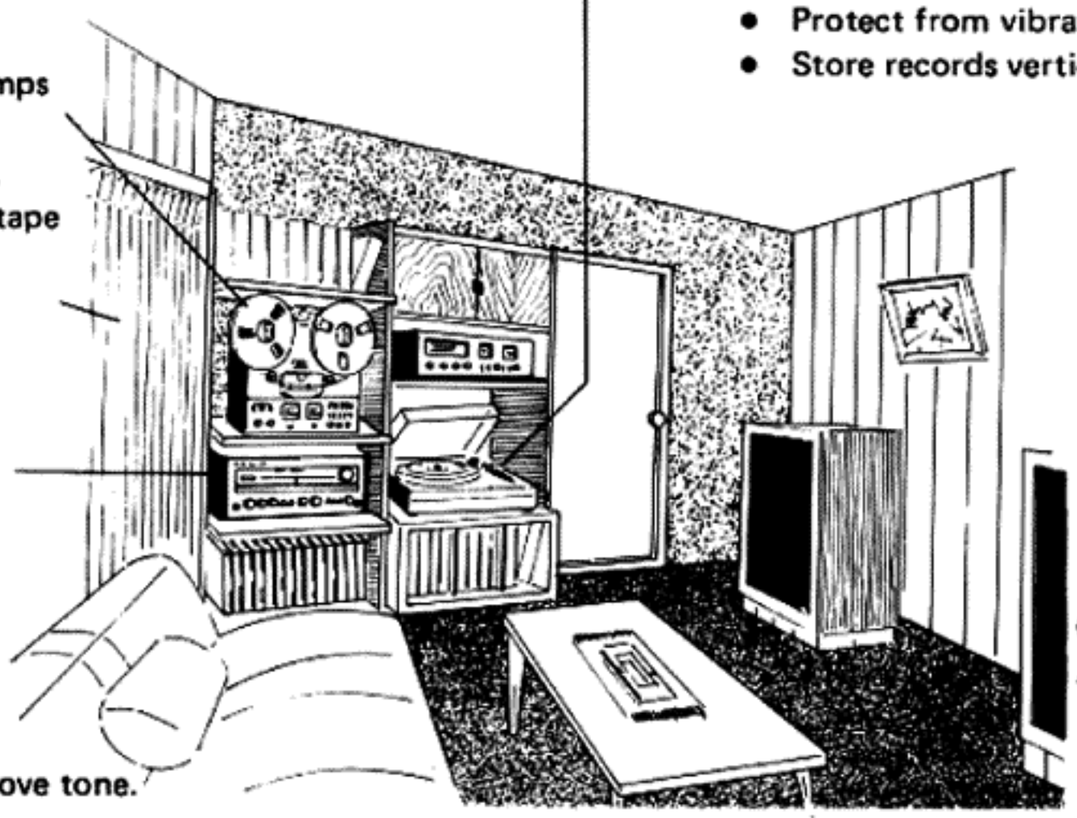
Fig. A

STEREO SYSTEM COMPOSITION

INSTALLATION PRECAUTIONS

When installing the SX-450 avoid locations such as the following:

- In direct sunlight, near radiators or other heat sources.
- In humid or dusty surroundings.
- On unlevel or unstable supports, or where subject to vibration.


Turntable
• Protect from vibrations and close dust cover whenever possible.
• Store records vertically and protect from dust and dirt.
Tape Deck
• Be sure to install reel clamps when using vertically.
• Always keep heads clean.
• Do not neglect recorded tape for long periods.
• Avoid magnetic fields.
Thick curtain shuts out direct sunlight.
SX-450 (Keep connecting cords as short as possible.)
Speaker System
Rear and side panels of left and right speakers should have the same surroundings.
(Placing with rear panel against a wall improves bass)
Install speakers so that vibrations are not transferred directly to the floor.
(Employ stands or concrete blocks with bookshelf type speakers)
Carpet
Absorbs sound and vibrations
(Placing in front of speakers is also effective.)
Furniture materials can improve tone.

Listening position slightly to the rear of the apex of an equilateral triangle formed with left and right speakers.

FEATURES

High Stability FM Tuner Circuit Elements

Junction type FET (RF amplifier) and frequency linear type precision 3-gang variable capacitor are employed in the FM front end. These are followed by a high performance Pioneer developed IC in the IF and phase locked loop (PLL) system IC in the MPX circuits to form a superb circuit composition utilizing high reliability elements. Outstanding performance is achieved in terms of such specifications as frequency drift, image rejection, S/N, capture ratio and selectivity. The low distortion, stable operation allows luxurious FM stereo reception to be fully enjoyed.

Low Distortion Power Amplifier and Extra Strength Power Supply

Differential first stage, balanced positive and negative power supply, quasi-complementary OCL circuit composes the power amplifier. The SX-450 delivers

Continuous Power Output of 15watts* per channel min, RMS at 8 ohms from 20 Hz to 20,000 Hz with no more than 0.5% total harmonic distortion.

Plenty of power is available, together with superb frequency response, output bandwidth and distortion characteristics. Two 4,700 microfarad electrolytic capacitors in the power supply section also assure stable operation even in low frequency reproduction.

Faithful Reproduction Preamplifier Section

PNP and NPN silicon transistor direct coupled circuit is employed in the equalizer amplifier together with stringently selected equalizer elements. RIAA deviation, the most vital factor in record playback, becomes suppressed to result in advanced fidelity. A transistorized voltage regulator circuit is also included which increases the maximum nominal input, broadening the dynamic range to allow enjoyment of low distortion record performances.

Compatible with All Program Sources

In addition to special jacks for turntable and tape decks, auxiliary (AUX) input jacks are provided for connecting a cartridge tape player or other component. Virtually all program sources can be connected. The front panel microphone jack also provides flexibility for record concert narration or public address applications.

2 Sets of Speaker Systems Can Be Used

The speaker switch can be used to select between two sets of stereo speaker systems. A-B comparison listening or simultaneous listening with speakers installed in another room become possible. A single SX-450 functions as two stereo amplifiers in this manner.

New Receiver Styling

Large easy to see tuning scale, excellent tuning feel and rich operating systems are combined in the integrated stereo amplifier. Both appearance and functions of the front panel express a quality Pioneer product.

FOR USE IN UNITED KINGDOM OR AUSTRALIA

CAUTION 240V

Mains supply voltage is factory adjusted at 240 volts.

WARNING

THIS APPARATUS MUST BE EARTHED.

IMPORTANT

The wires in this mains lead are coloured in accordance with the following code:

Green-and-Yellow:	Earth
Blue:	Neutral
Brown:	Live

As the colours of the wires in the mains lead of this apparatus may not correspond with the coloured markings identifying the terminals in your plug proceed as follows.

The wire which is coloured green-and-yellow must be connected to the terminal in the plug which is marked by the letter E or by the safety earth symbol ⏚ or coloured green or green-and-yellow.

The wire which is coloured blue must be connected to the terminal which is marked with the letter N or coloured blue or black.

The wire which is coloured brown must be connected to the terminal which is marked with the letter L or coloured brown or red.

The AC Outlets of this apparatus have been removed from this apparatus in order to comply with U.K. Safety Regulation. Ensure that your equipment is connected correctly—if you are in doubt, consult a qualified electrician.

Do not unscrew the bottom plate and cabinet. No user serviceable parts inside.

Always disconnect all the equipment from the mains supply when disconnecting the signal leads.

The Power cord should be connected last, make sure that the Power switch is OFF. Be sure the appliance connector is fully inserted into the AC inlet.

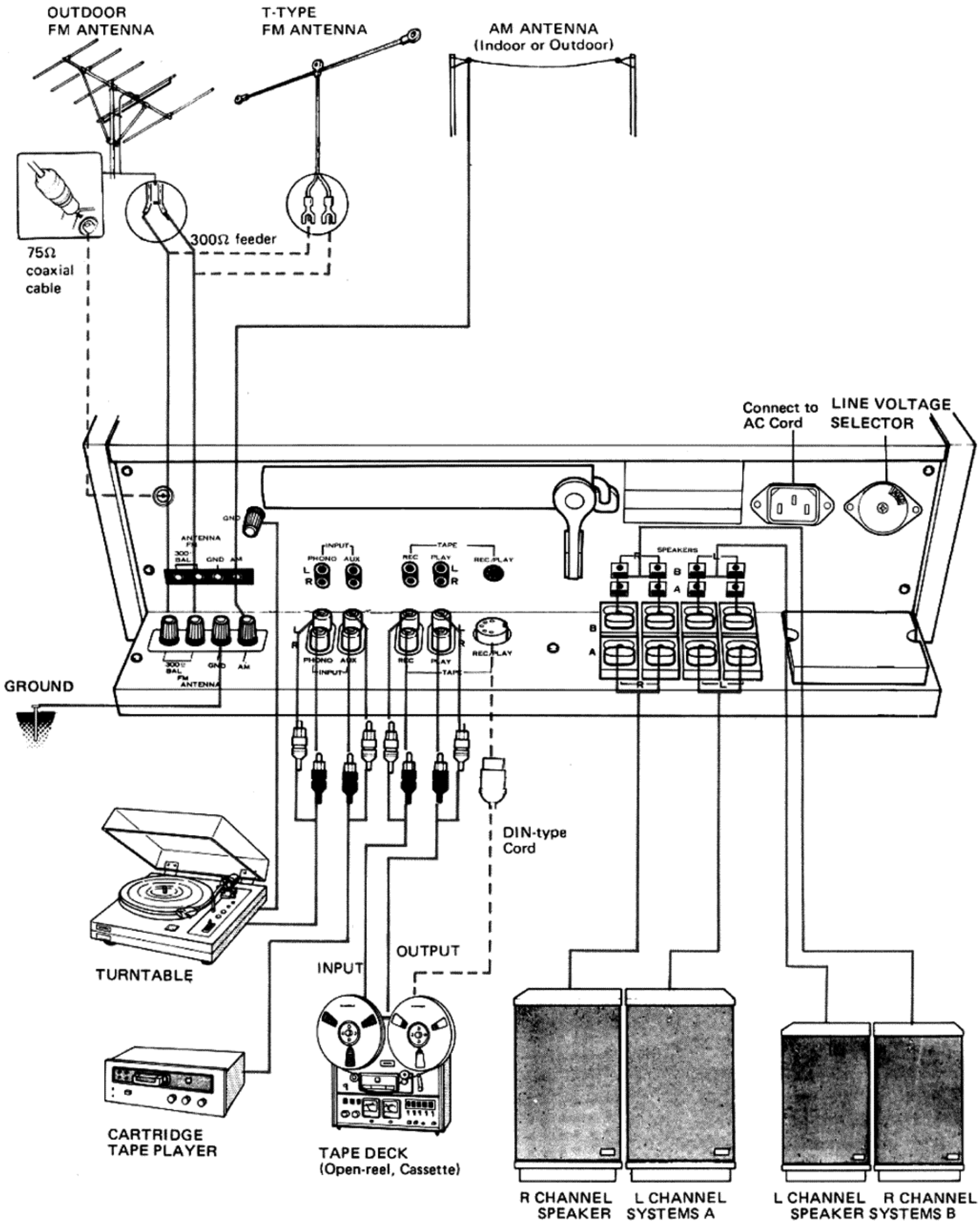
Unplug the set from the wall socket when it is not to be used for an extended period of time.

FOR YOUR SAFETY

1. Insert this plug only into effectively earthed three-pin plug-socket outlet.
2. If any doubt exists regarding the earthing, consult a qualified electrician.
3. Extension cords, if used, must be three-core correctly wired.

*Measured pursuant to Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.

CONNECTION DIAGRAM



CONNECTIONS

SPEAKER SYSTEMS CONNECTION

The receiver is provided with two sets of speaker terminals for connecting two sets of stereo speaker systems. If only one set is to be used, connect it to the A terminals (selected by the SPEAKER switch in the A position).

As shown in Fig. 1, connect the right channel speaker system (at listener's right as viewed from listening position) to the R terminals and the left channel speaker system to the L terminals.

- Perform connections carefully to avoid reversing polarities. Red terminals are plus (+) and black terminals minus (−), while the terminals of the speaker system also possess + and − polarities. Be sure to connect + to + and − to − .
- In the same manner, a second set of stereo speaker systems can be connected to the B terminals (selected by the SPEAKER switch in the B position).

Speaker Lead Wire Preparation and Connection (Fig. 2)

1. Strip about 10mm (3/8 inch) of the insulation from the end of the speaker lead wire.
2. If the conductor is stranded, twist the strands together so they do not come loose.
3. Depress the black colored button of the speaker terminal, insert the speaker minus lead wire into the adjacent hole, and release the button.
4. In the same manner, connect the speaker plus lead wire into the hole above the red button.

TURNTABLE CONNECTION

Connect a turntable equipped with a moving magnet (MM) type cartridge to the PHONO jacks, taking care to observe L and R channels. The ground lead of the turntable should be connected to the GND terminal (Fig. 3).

Cartridge Note:

Moving magnet (MM) type phono cartrimges are directly compatible with the receiver. If using another type of cartridge which differs in output adaptor will be required. See cartridge operating instructions.

USE OF THE AUX JACKS (Fig. 3)

These are auxiliary input jacks, which can be used to connect a cartridge tape player, television sound tuner, or other signal source. Be sure to connect L and R channels correctly.

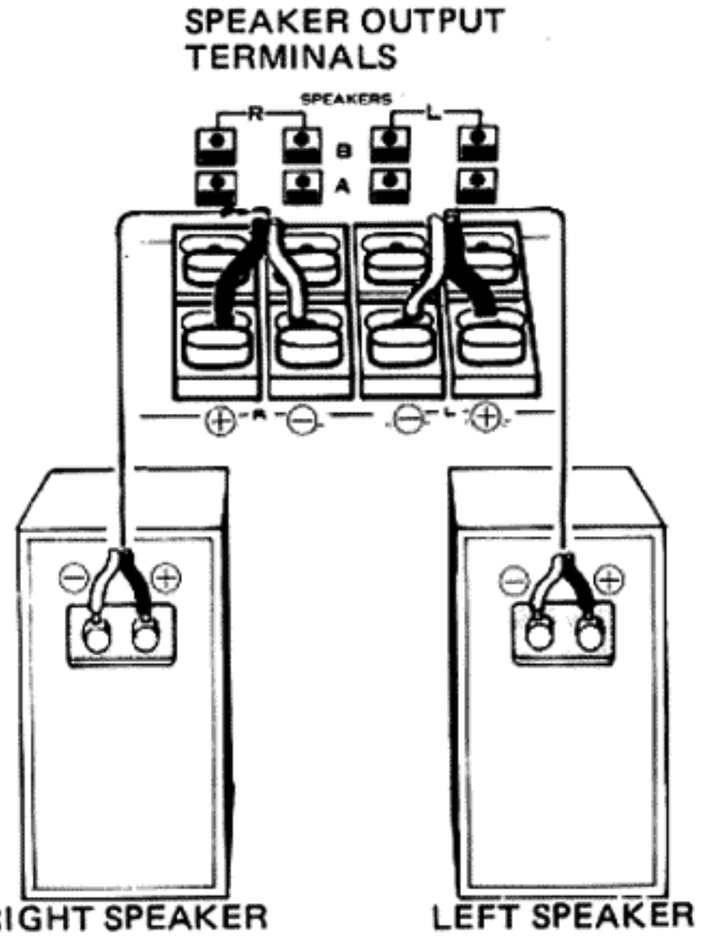


Fig. 1

NOTE:
When two sets of speaker systems are being used at the same time (A and B), please ensure that the impedance of each speaker system is not less than 8Ω. Use caution since connecting a speaker system of less than 8Ω in this case can lead to malfunctions.

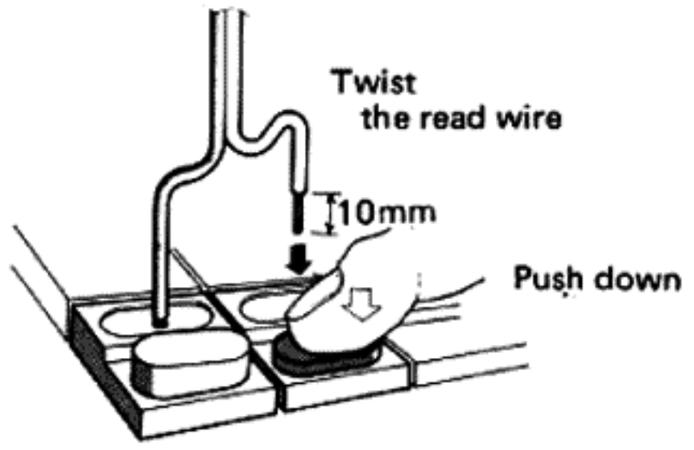


Fig. 2

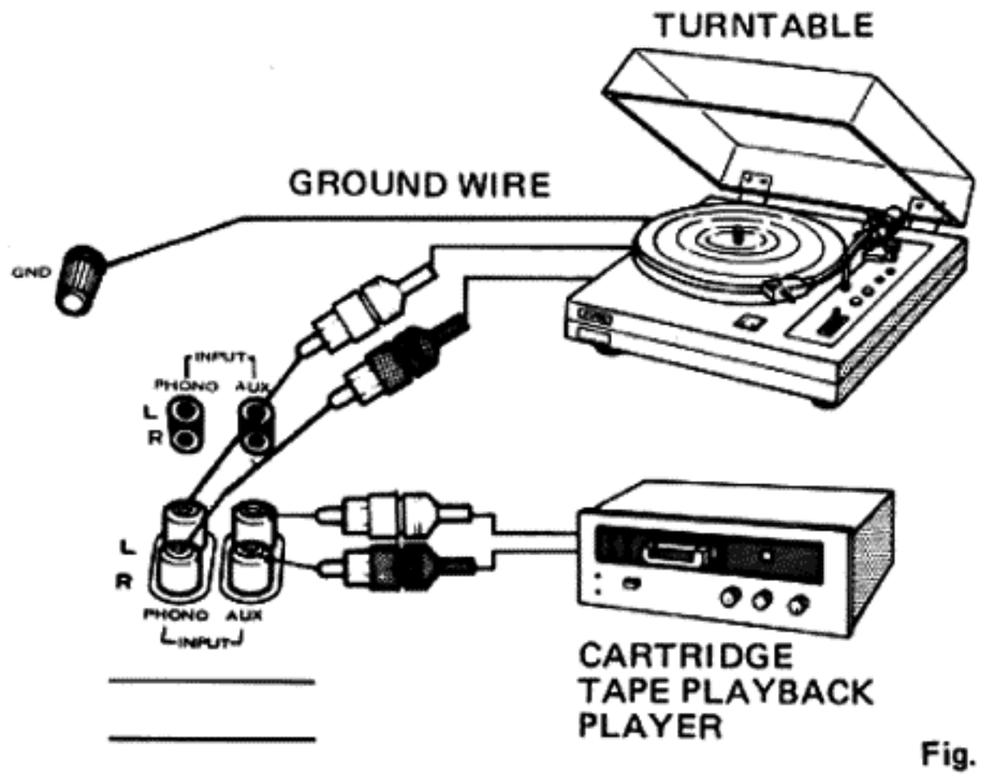


Fig. 3

ANTENNA AND GROUND CONNECTIONS

FM ANTENNA CONNECTIONS

FM broadcast signals are sharply affected by intervening mountains or buildings, or inside metal framed structures, since the signals are weakened and reflections can interfere with reception. Care is thus needed in selecting a suitable FM antenna to match the surrounding conditions and field strength.

FM Outdoor Antenna

The antenna should normally be installed as follows:

- Connect antenna feeder to the 300Ω antenna terminals of the receiver as shown in Fig. 4.
- While listening to a broadcast as described on page 10, determine the best position for optimum reception, and secure the antenna firmly.

NOTE:
In urban locations where traffic is heavy, industrial zones, or when nearby high voltage power lines are present, an ordinary FM antenna may not be adequate to prevent noise. The problem can often be solved by using a special FM antenna and 75Ω coaxial cable to connect it to the receiver. Connect the cable to the 75Ω UNBAL connector as shown in Fig. 5.

T-type Antenna

When stations are nearby, or in wooden frame buildings, etc. where FM signals are strong, the accessory T-type antenna can be employed.

- As shown in Fig. 4, connect the T-type antenna to the 300Ω antenna terminals, spread the arms horizontally and while listening to an FM station, position the antenna for best reception. The antenna can then be taped to a wall or ceiling.

NOTE:
Consult audio dealer for defailed information on FM outdoor antenna installation.

AM ANTENNA CONNECTIONS

Normally, position the ferrite bar antenna (Fig. 6) for best reception while listening to an AM station as described on page 10.

AM Indoor Antenna

If reception is difficult with the bar antenna, an indoor AM antenna can be erected with vinyl insulated wire as shown in Fig. 7.

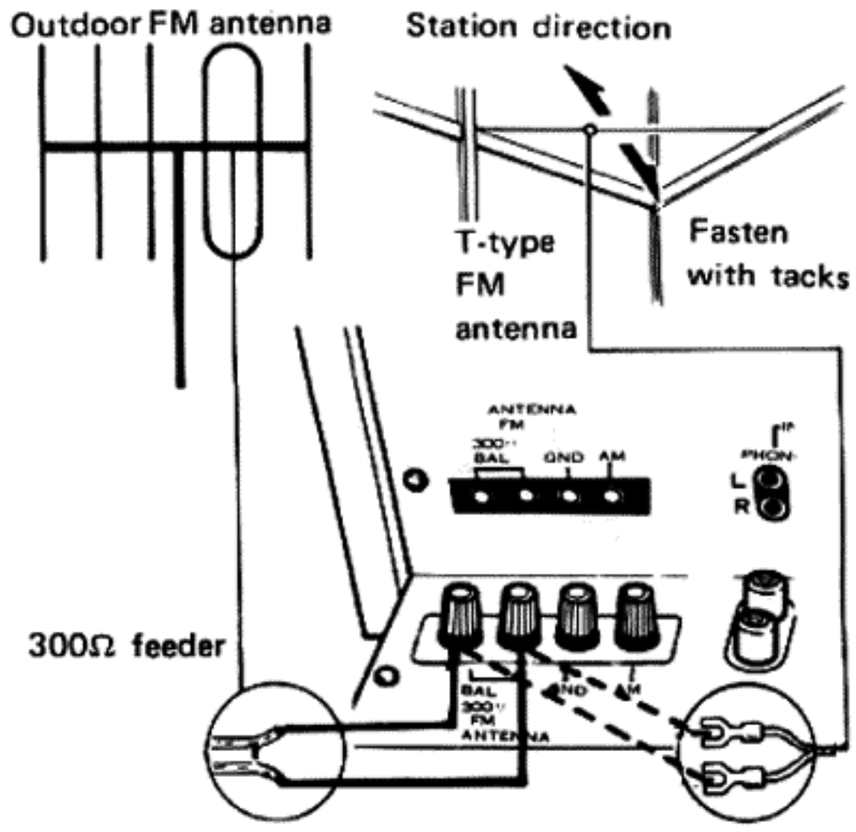


Fig. 4

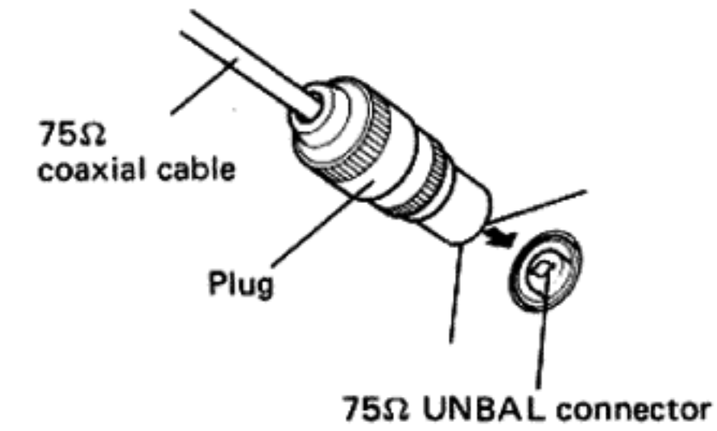
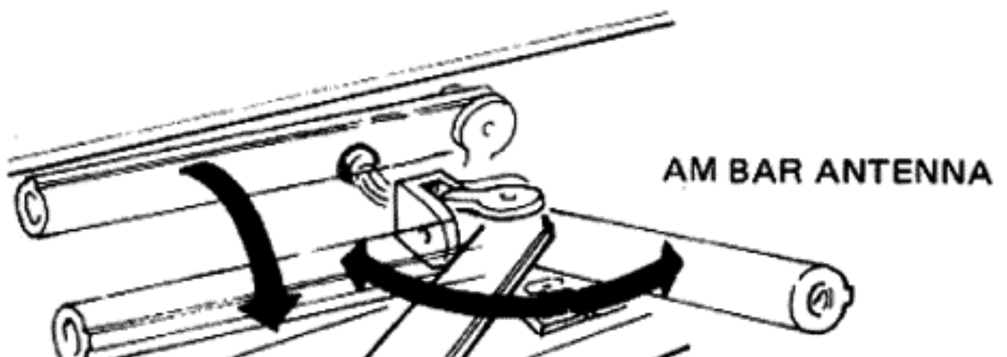


Fig. 5



Turn bar antenna until best reception is obtained.

Fig. 6

AM Outdoor Antenna

For optimum AM reception, an outdoor AM antenna using vinyl insulated wire can be erected as shown in Fig. 7.

GROUND

For maximum safety and to eliminate noise, connect the GND terminal to an earth ground if at all possible. See Fig. 7.

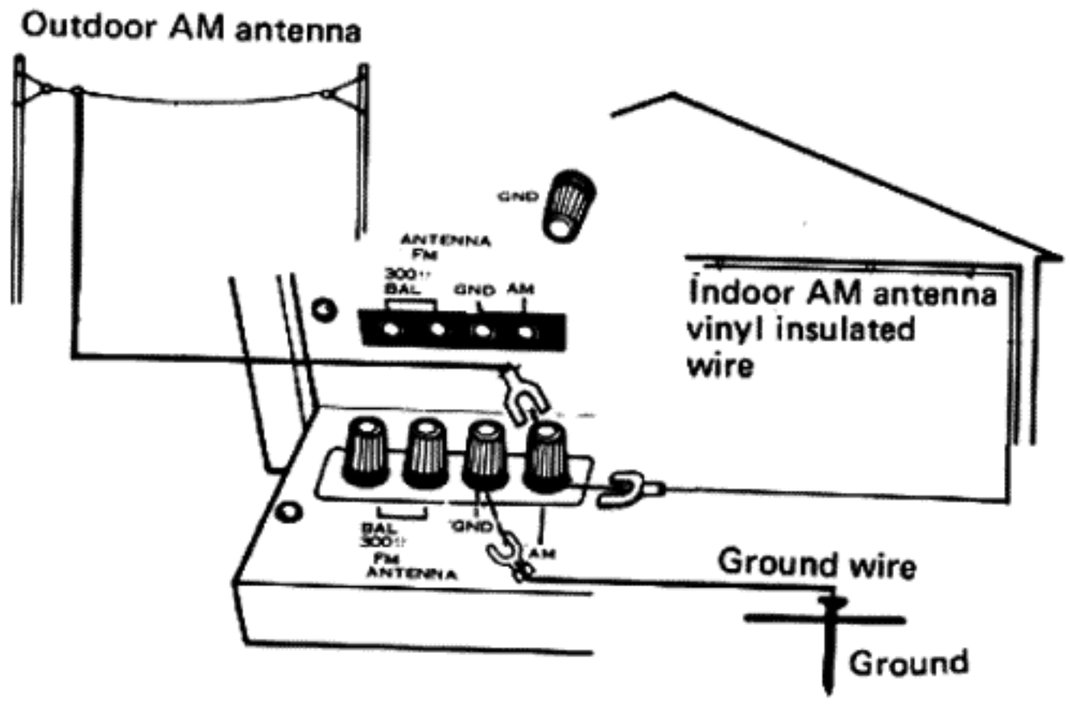


Fig. 7

TAPE DECK CONNECTIONS

The receiver can be connected to a stereo tape deck (reel-to-reel, cassette) for recording and playback. Connecting cords are usually supplied with the tape deck. Connect as follows:

RECORDING CONNECTIONS

The recording output signal is present at the TAPE REC jacks.
Connect the recording input (LINE INPUT) jacks of a tape deck to the TAPE REC jacks of the receiver, taking care to connect left and right channels correctly.

PLAYBACK CONNECTIONS

Connect the playback output (LINE OUTPUT) jacks of a tape deck to the TAPE PLAY jacks, taking care to connect left and right channels properly.

TAPE REC/PLAY Jack Connection

If the tape deck is provided with a DIN type REC/PLAY jack, use a separately sold connecting cord to connect it to the TAPE REC/PLAY jack of the receiver. Both recording and playback connections are then performed with the single cord. In this case, do not connect any components to the TAPE REC and PLAY jacks.

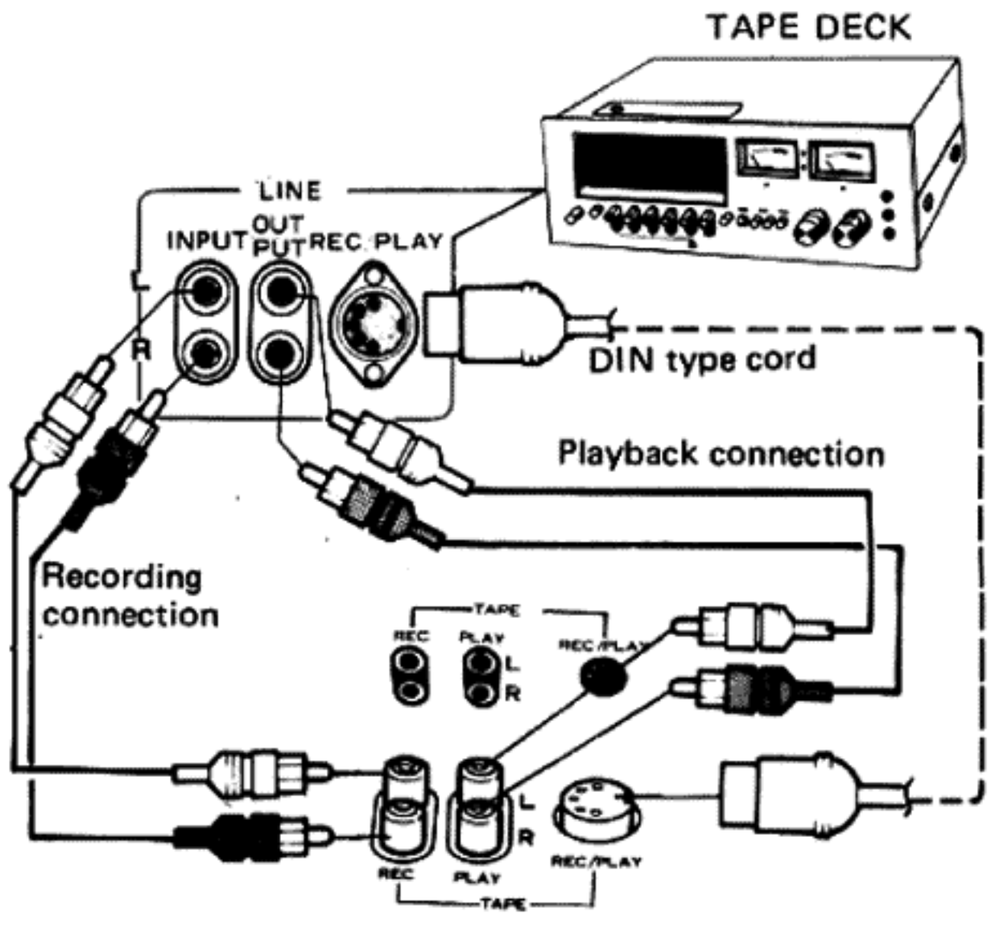


Fig. 8

FRONT PANEL FACILITIES

SPEAKERS SWITCH (POWER)

A combined power ON/OFF switch and speaker system selector switch.

POWER OFF:	Receiver off.
A:	To select speakers connected to the A speaker terminals.
OFF:	Speakers cut off (headphones can be used).
B:	Operates speakers connected to the B speaker terminals.
A+B:	To listen simultaneously to speaker systems connected to A and B speaker terminals.

PHONES JACK

To listen through stereo headphones, plug them firmly into this jack.

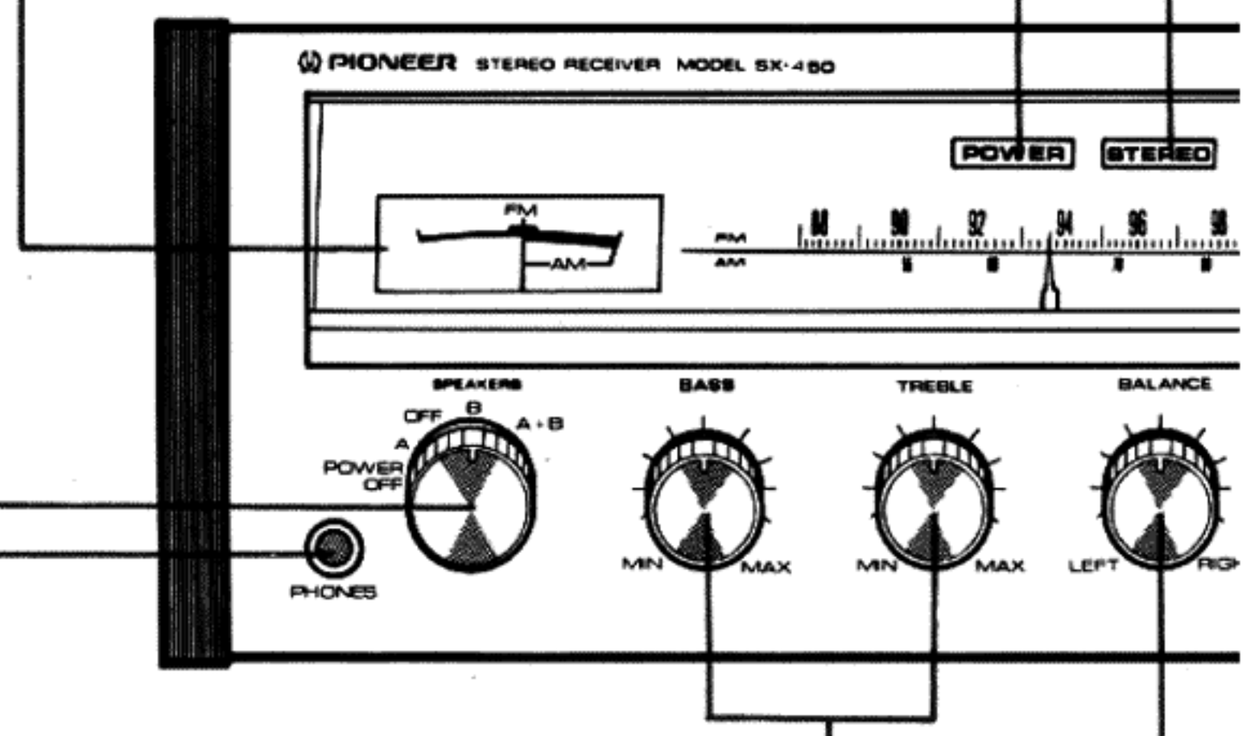
WARNING:
Do not plug a microphone into the PHONES jack as you may damage the microphone.

AM/FM TUNING METER

When tuning in FM stations, position the needle in the center FM area for optimum reception. In the case of AM stations, tune for maximum meter deflection toward the right of the scale.

PILOT LAMP

Lights to indicate AC power ON.



BASS & TREBLE CONTROLS

Controls for adjusting the tone. Adjust low frequencies with the BASS control and high frequencies with the TREBLE control.
Turn controls toward the right (MAX) to enhance, and toward the left (MIN) to reduce, their respective frequency ranges.

BALANCE CONTROL

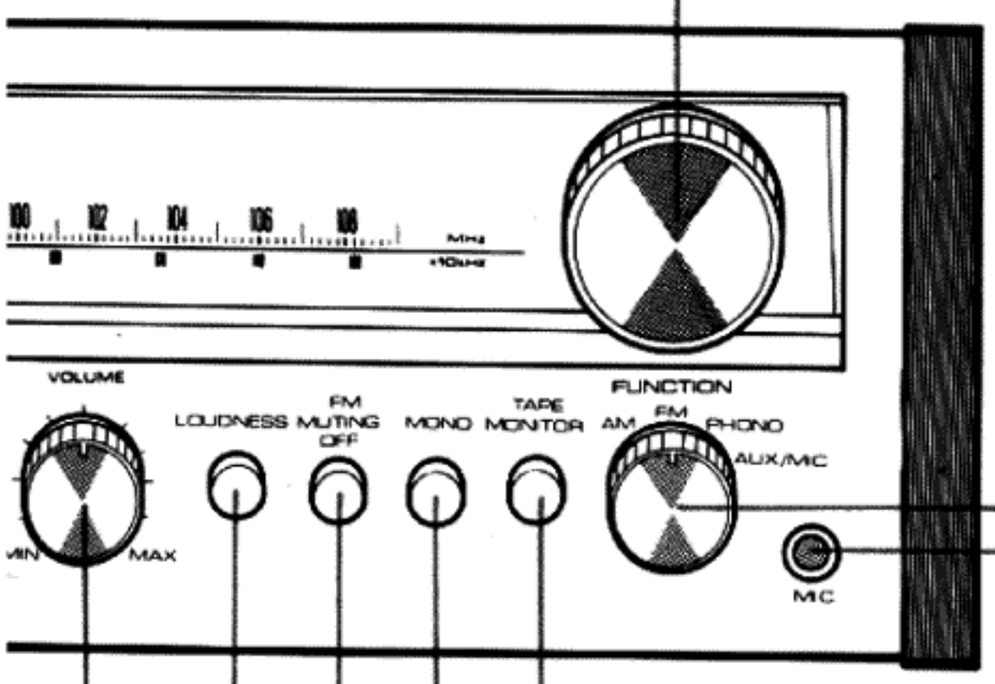
Control for adjusting volume balance between left and right speakers or headphones. Clockwise rotation from center increases right channel volume, while counter-clockwise rotation increases left channel volume.

FM STEREO INDICATOR

With the FUNCTION switch set to FM, the STEREO indicator lights while an FM stereo broadcast is being received.

TUNING KNOB

Select the desired station while observing the AM/FM meter for optimum tuning.



FUNCTION SWITCH

Switch for selecting desired program source.

AM: For AM broadcast reception.

FM: For FM stereo reception. Automatically receives monophonically during FM monophonic broadcasts. The STEREO indicator lights up when the broadcast is in stereo.

PHONO: To operate a turntable connected to PHONO jacks.

AUX/MIC: For listening to an audio component (cartridge tape player, TV sound tuner, etc.) connected to the AUX jacks. Also set to this position when using the microphone.
Note, when the microphone is plugged in, the component connected to the AUX jacks cannot be used.

MIC JACK

A high impedance (approx. 50k-ohms) dynamic type microphone with a standard plug can be connected to this jack.

FM MUTING OFF BUTTON

Leave this button undepressed (in the ON position) to suppress unpleasant interstation noise while tuning between FM stations. Low-strength signals may also be suppressed by this function, so to pick up a weak station depress this button to the OFF position.

TAPE MONITOR BUTTON

Depress this switch when using a tape deck for tape playback, or when monitoring a tape during recording.

NOTE:
Except for tape playback, keep this switch in the underpressed position.

LOUDNESS BUTTON

Depress this switch when listening at low volume. The frequency response of the human ear varies according to the listening level, and the depressed position compensates for hearing characteristics by emphasizing the bass and treble.

MODE SWITCH (MONO)

For stereo playback leave this switch undepressed. When depressed for MONO playback, left and right channel stereo signals will be mixed to produce monophonic sound from both speaker systems.

NOTE:
Recording stereophonically with the MODE switch in the MONO position may cause channel separation to deteriorate.

VOLUME CONTROL

Clockwise rotation increases volume from speakers or headphones.

OPERATIONS

Before switching on the power, set the various controls as follows:

- VOLUME control to MIN.
- BALANCE control to the center position.
- TAPE MONITOR switch to OFF(undepressed).
- BASS & TREBLE controls to the center positions.
- MODE switch to STEREO (undepressed).
- FM MUTING OFF button to ON (undepressed).

It is important to set these controls as indicated to avoid any inadvertent overload on the receiver or speakers, etc. when power is switched on.
The receiver may now be switched on, and the required speaker systems selected.

FM RECEPTION

1. Set the FUNCTION switch to FM.
2. Leave the FM MUTING OFF button in the ON position. Note, however, that in areas of low signal strength the signal may be suppressed. In this case only, the FM MUTING OFF button should be depressed to the OFF position.
3. Select the station by means of the TUNING knob. Best reception is obtained when the AM/FM TUNING meter needle is exactly in the center (see Fig. 9).
4. Adjust the level of the sound with the VOLUME control, and use the BASS & TREBLE controls to adjust for the tone quality of your preference.

- The FM STEREO indicator lights during FM stereo reception, but does not light during monophonic reception.

AM RECEPTION

1. Set the FUNCTION switch to AM.
2. Turn the TUNING knob to select your station. Best reception is obtained when the AM/FM TUNING meter needle deflects to the extreme right (Fig. 10).
3. Adjust the VOLUME, BASS & TREBLE controls for the listening level and tone quality of your preference.

NOTE:
If, when listening to either FM or AM broadcasts listening pleasure is seriously affected by poor sensitivity or heavy interference, refer to the section "ANTENNA CONNECTIONS" on page 6 and make any necessary changes.

PLAYING RECORDS

1. Set the FUNCTION switch to PHONO.
2. Operate the turntable to play the record.
3. Adjust the VOLUME, BASS & TREBLE controls for the listening level and tone quality of your preference.

USING THE AUX JACKS

To play equipment connected to the AUX jacks, proceed as follows:

1. Set the FUNCTION switch to AUX/MIC.
2. Operate the attached component.
3. Adjust the VOLUME, BASS & TREBLE controls for the listening level and tone quality of your preference.

NOTE:
If a microphone is connected to the MIC jack, it will override the AUX signal.

USING THE MICROPHONE

1. Connect the microphone to the MIC jack.
2. Set the FUNCTION switch to AUX/MIC.
3. Adjust the sound level by turning the VOLUME control gradually to the right. The midway setting of the BASS & TREBLE controls will usually be best.

NOTE:

- *Monophonic sound can be heard from both left and right channel speaker systems.*
- *You should use high impedance (above 20k-ohms) microphones of the dynamic type, with standard 6mm diameter phone plugs.*
- *Under certain conditions microphones are liable to give rise to "howling" or feedback noise. Be careful not to raise the volume too high when the microphone is close to the speaker systems or in a room with a great deal of resonance. This tendency can be reduced by setting the BASS and TREBLE controls to their center positions.*
- *When employing a microphone, set the output volume of a component connected to the AUX jacks to minimum, or disconnect the component.*

FM Reception

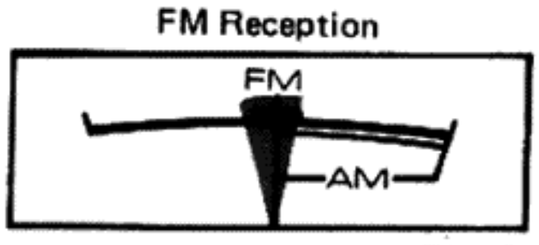


Fig. 9

AM Reception

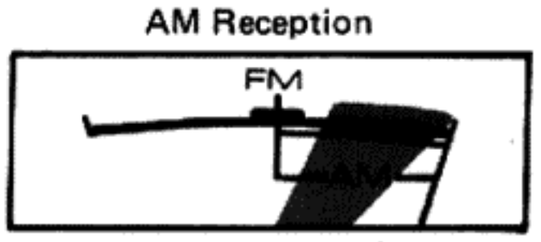


Fig. 10

With a full 4 ohms load connected the receiver, do not apply a sinewave signal continuously at full power more than 1 hour.

USING TAPE DECKS

TAPE PLAYING

As shown in Fig. 11, the tape deck is connected to TAPE PLAY jacks.

1. Set the TAPE MONITOR button to ON (depressed) position.
2. Operate tape deck and play tape.
3. Adjust VOLUME, BASS & TREBLE controls for desired volume and tone.

NOTE:
With the TAPE MONITOR button depressed, the tape deck playback sound will be obtained from the speakers regardless of the FUNCTION switch setting.

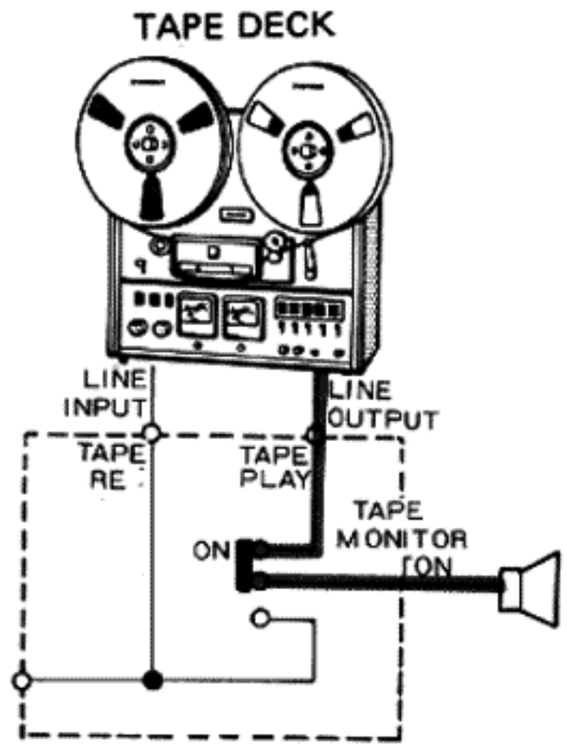


Fig. 11

TAPE RECORDING

The program source selected by the FUNCTION switch is always present at the TAPE REC jacks.

1. Set the FUNCTION switch according to the source to be recorded. See Fig. 12.
2. Operate selected component and adjust for optimum sound.
3. Adjust recording levels with the controls of the tape deck and proceed with recording.

NOTE:
The receiver VOLUME, BASS & TREBLE controls have no effect upon the signal at the TAPE REC jacks.

Recording Monitor

If the tape deck is a 3 head type recording conditions can be monitored from the speakers or headphones by setting the TAPE MONITOR button to ON (depressed). Both recording and playback connections must be performed in order to use this facility.

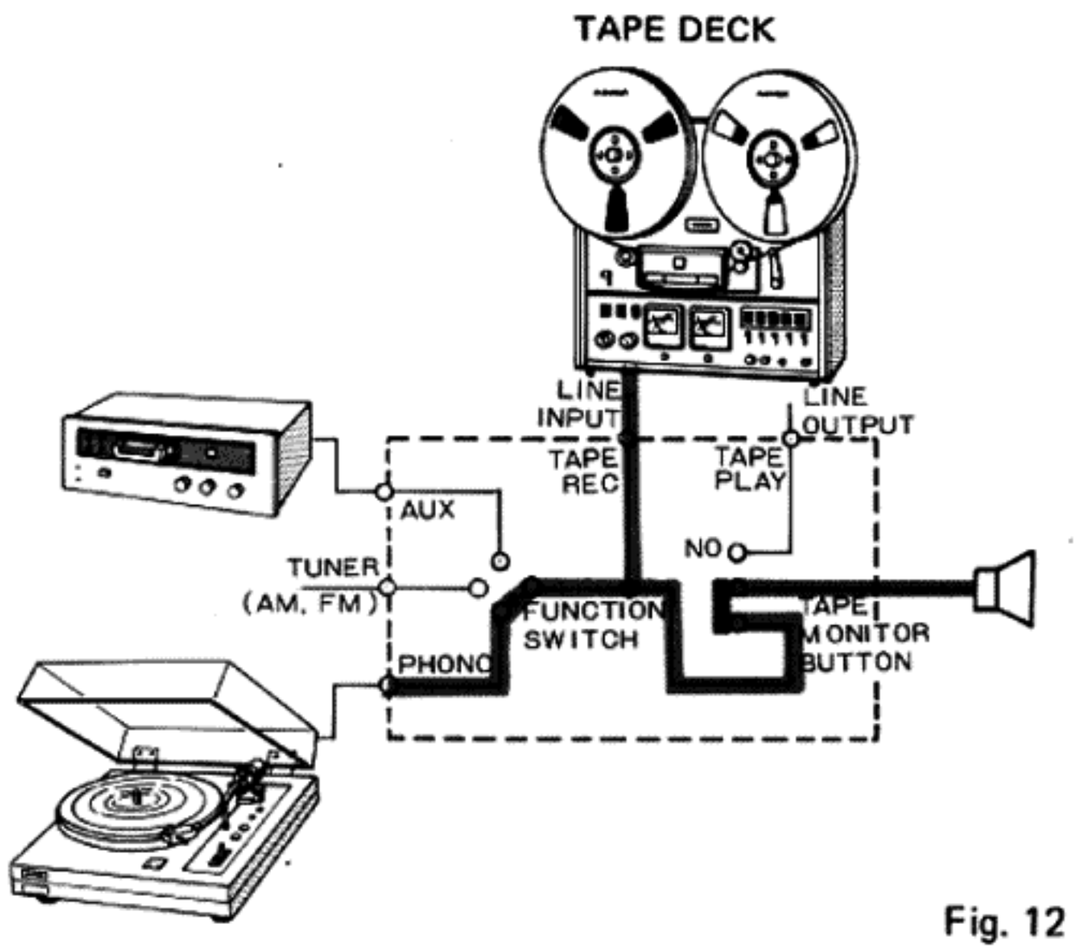


Fig. 12

TAPE DUPLICATING

With two tape decks, you can duplicate tape-to-tape, or edit recordings while re-recording. For example, you can first tape a complete FM stereo program, with announcements and commercials, and later re-record on another tape while cutting out unwanted portions.

1. Connect two tape decks as shown in Fig. 13.
2. Set the FUNCTION switch to AUX, and operate the tape deck connected to the AUX jacks as the program source.
3. Record the program onto the tape deck connected to the TAPE jacks, controlling the recording level by means of the controls on that deck.
4. To check recording conditions, set the TAPE MONITOR button to ON (depressed position).

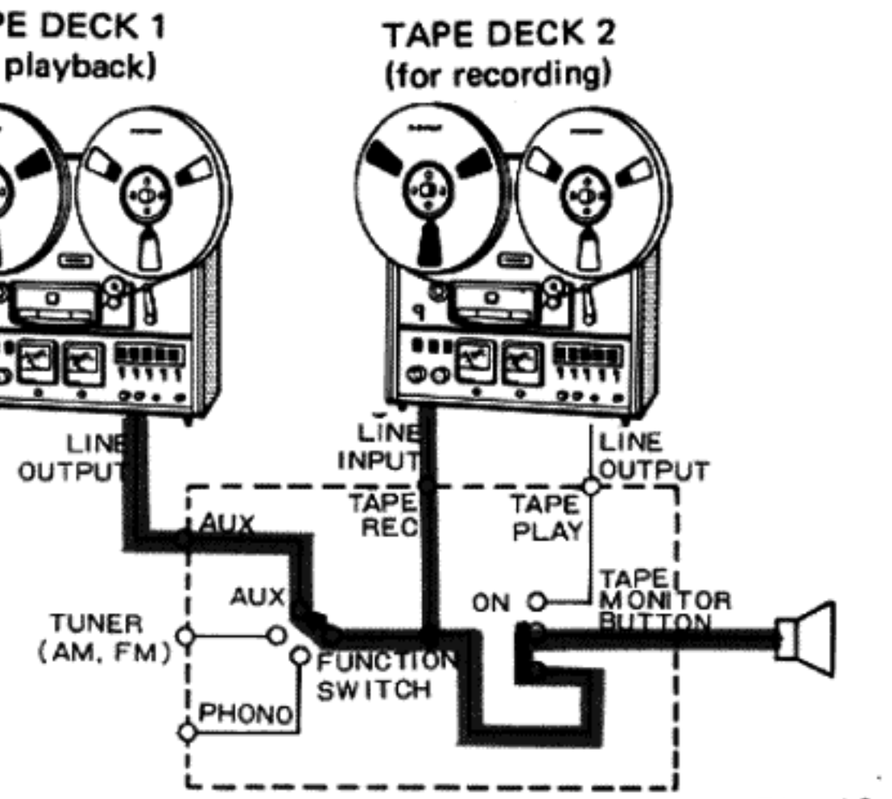
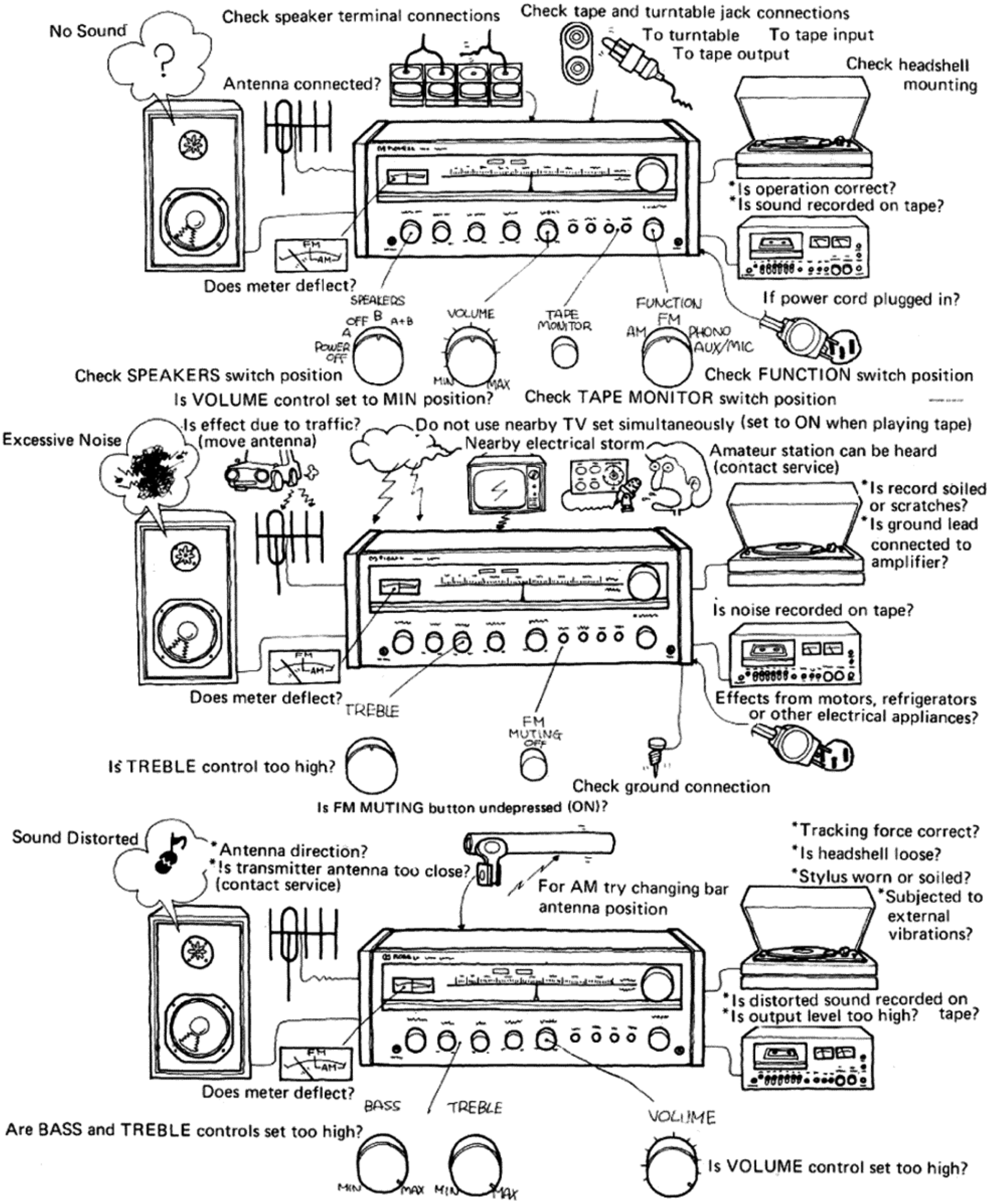


Fig. 13

CONDITIONS FREQUENTLY MISTAKEN FOR MALFUNCTIONS

If trouble is experienced, perform the following simple checks. In most cases, the difficulty can be traced to incorrect operation or faulty connections. If the problem cannot be corrected, contact a Pioneer Authorized Service Center.



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AM/FM STEREO RECEIVER

SX-450 HG

SPECIFICATIONS

Semiconductors

FET 1
ICs 3
Transistors 28
Diodes 15

Power Amplifier Section

Continuous Power Output of 15 watts* per channel, min. RMS, at 8 or 4 ohms from 20 Hertz to 20,000 Hertz with no more than 0.5% total harmonic distortion.

Total Harmonic Distortion (20 Hertz to 20,000 Hertz, from AUX)
- Continuous Rated Power Output . . . . . No more than 0.5%
- 1 watt per channel power output, 8 ohms. . . . . No more than 0.1%

Intermodulation Distortion (50 Hertz : 7,000 Hertz = 4 : 1, from AUX)
- Continuous Rated Power Output . . . . . No more than 0.5%
- 1 watt per channel power output, 8 ohms . . . . . No more than 0.1%

Damping Factor (20Hz to 20,000Hz, 8 ohms) 25

Input (Sensitivity/Impedance)
- PHONO . . . . . 2.5mV/50k ohms
- MIC . . . . . 7.5mV/50k ohms
- AUX . . . . . 150mV/50k ohms
- TAPE PLAY . . . . . 150mV/50k ohms
- TAPE PLAY (DIN connector) . . . . . 150mV/50k ohms

PHONO Overload Level (T.H.D. 0.1%)
- PHONO 150mV (1kHz)

Output Level/Impedance
- TAPE REC 150mV
- TAPE REC (DIN connector) . . . . . 30mV/80k ohms
- SPEAKER . . . . . A, B, A+B
- HEADPHONE . . . . . Low Impedance

Frequency Response
- PHONO (RIAA equalization) . . . . . 30Hz to 15,000Hz $^{+0.5}_{-1}$dB
- AUX, TAPE PLAY . . . . . 20Hz to 60,000Hz ±1dB

Tone Control
- BASS . . . . . +10dB, −9dB (100Hz)
- TREBLE . . . . . +9dB, −10dB (10kHz)

Loudness Contour (Volume control set at −40dB position) . . . . . +6dB (100Hz), +3dB (10kHz)

Hum and Noise (IHF, short-circuited, A Network, rated power)
- PHONO 70dB
- AUX, TAPE PLAY 90dB

FM Section

Usable Sensitivity . . . . . MONO 11.2dBf (2.0μV)
STEREO 20.0dBf (5.5μV)

50dB Quieting Sensitivity . . . . . MONO 18.3dBf (4.5μV)
STEREO 39.2dBf (50μV)

Signal to Noise Ratio at 65dBf . . . . . MONO 70dB
STEREO 65dB

Distortion at 65dBf 100Hz . . . . . MONO 0.15%
STEREO 0.3%
1kHz . . . . . MONO 0.15%
STEREO 0.3%
6kHz . . . . . MONO 0.4%
STEREO 0.4%

Frequency Response . . . . . 30Hz to 15,000Hz $^{+0.5}_{-1.0}$dB
Capture Ratio 1.0dB
Alternate Channel Selectivity 60dB
Spurious Response Ratio 75dB
Image Response Ratio 65dB
IF Response Ratio 85dB
AM Suppression Ratio 50dB
Muting Threshold 14dBf (2.8μV)
Stereo Separation . . . . . 40dB (1kHz), 30dB (30Hz ~ 15kHz)
Subcarrier Product Ratio 40dB
SCA Rejection Ratio 40dB
Antenna Input . . . . . 300 ohms balanced
75 ohms unbalanced

AM Section

Sensitivity (IHF, Ferrite antenna) 300μV/m
(IHF, Ext. antenna) 15μV
Selectivity 35dB
Signal-to-Noise Ratio 50dB
Image Response Ratio 40dB
IF Response Ratio 65dB
Antenna . . . . . Built-in Ferrite Loopstick Antenna

Miscellaneous

Power Requirements 220V/240V 50Hz
Power Consumption 130W
Dimensions . . . . . 448(W)x141(H)x307(D) mm
17-4/8(W)x5-9/16(H)x12-1/16(D) in
Weight . . . . . Without package . . . . . 8.6kg (19 lb)
With package . . . . . 9.7kg (21 lb 6 oz)

Furnished Parts

FM T-type Antenna 1
Operating Instructions 1

** Measured pursuant to Federal Trade Commission's Trade Regulation rule on Power Output Claims for Amplifiers.*

NOTE:
Specifications and the design subject to possible modification without notice due to improvements.